In Situ LA-ICP-MS Microanalyses and its Significance on Lead of Silicate Minerals from Shizhuyuan Tungsten-Polymetallic Deposit

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Nowadays, heavy metal contamination of soils especially surrounding mining areas has been regarded as a significant environmental concern with the development of economy and industry. Lead(Pb), as one of the main heavy metal elements in soils, has caused great damage to ecological environment and even human health because of its toxicity and environmental persistence. The content and environmental availbility of the lithogenic Pb in soils mainly depend on the occurrence state and distribution in minerals of parent rocks. This paper purposes the occurrence state and the transformation of Pb between minerals in granite and skarn on mineral scale. Shizhuyuan tungsten-polymetallic deposit is a rare large-sized skarn-type W-Sn-Mo-Bi polymetallic deposit lying in Nanling middle section in Hunan, China. Based on detailed field investigation, we focused on the systematic microscope observation and in situ LA-ICP-MS analyses of the main silicate minerals in granite and skarn rocks from Shizhuyuan deposit. We preliminarily discussed Pb content and the occurrence state as well as the distribution and transformation between different silicate minerals. Among the main silicate minerals in granite, Pb mainly hosts in K-feldspar and is inferred to be in the lattice of K-feldspar as isomorphism with K^+. Among the main silicate minerals of skarn, Pb mainly hosts in epidote and is inferred to be as isomorphism with Ca^{2+}. Pb content is relatively lower in main silicate minerals of skarn compared with those of granite. During the process of skarn formation, Pb may activate from the mineral in granite into the hot liquid. Then they may get into the main minerals in skarn as isomorphous substitution. Thus we should also pay attention to Pb dispersion in weathering process of surrounding rocks from Shizhuyuan mining area along Xiangjiang river.

Key words: granite; skarn; silicate minerals; LA-ICP-MS; Lead